

## Claims

- [1] An apparatus for fixing a stator of a motor of a reciprocal compressor, comprising:  
a front frame;  
a cylinder inserted into and coupled to the front frame;  
an outer stator supported by the front frame in a contact state;  
an inner stator formed in a cylindrical shape and inserted onto the outside circumferential surface of the cylinder with a predetermined interval from an inside diameter of the outer stator;  
a mover inserted between the outer stator and the inner stator, and coupled to a piston inserted into the cylinder; and  
a stator fixing means incorporated with the front frame to pass through the cylinder or the inner stator in the longitudinal direction, for supporting and fixing both sides of the inner stator.
- [2] The apparatus of claim 1, wherein the stator fixing means comprises a first supporting unit formed at one side of the front frame with a predetermined area, for contacting and supporting one side of the inner stator, a plurality of passage grooves formed in the longitudinal direction on the inside circumferential surface of the inner stator contacting the outside circumferential surface of the cylinder, a plurality of filling bar units extended from the first supporting unit, and inserted into the passage grooves of the inner stator, respectively, and a second supporting unit formed by connecting the filling bar units, for supporting the other side of the inner stator.
- [3] The apparatus of claim 2, wherein the passage grooves are formed on the inside circumferential surface of the inner stator in the circumferential direction at predetermined intervals.
- [4] The apparatus of claim 2, wherein the sections of the filling bar units and the sections of the passage grooves are formed in a rectangular shape.
- [5] The apparatus of claim 2, wherein the first supporting unit is vertical to the outside circumferential surface of the cylinder.
- [6] The apparatus of claim 2, wherein the second supporting unit is formed in a ring shape with a predetermined thickness, and extended from the filling bar units.
- [7] The apparatus of claim 1, wherein the stator fixing means comprises a first supporting unit formed at one side of the front frame with a predetermined area,

for contacting and supporting one side of the inner stator, a plurality of passage grooves formed in the longitudinal direction on the outside circumferential surface of the cylinder contacting the inside circumferential surface of the inner stator, a plurality of filling bar units extended from the first supporting unit, and inserted into the passage grooves of the cylinder, respectively, and a second supporting unit formed by connecting the filling bar units, for supporting the other side of the inner stator.

- [8] The apparatus of claim 7, wherein the passage grooves are formed on the outside circumferential surface of the cylinder in the circumferential direction at pre-determined intervals.
- [9] The apparatus of claim 7, wherein the sections of the filling bar units and the passage grooves are formed in a semicircular shape.
- [10] The apparatus of claim 7, wherein the first supporting unit is vertical to the outside circumferential surface of the cylinder.
- [11] The apparatus of claim 7, wherein the second supporting unit is formed in a ring shape with a predetermined thickness, and extended from the filling bar units.
- [12] The apparatus of claim 1, wherein the cylindrical inner stator is a stacked body formed by stacking a predetermined shape of thin plates, wherein the thin plates composing the cylindrical stacked body are stacked toward the center direction of the cylindrical stacked body.
- [13] A method for fixing a stator of a motor of a reciprocal compressor, comprising the steps of:
  - forming an inner stator by stacking a plurality of thin plates in a cylindrical shape;
  - forming a cylindrical cylinder to be inserted into the inner stator;
  - inserting the cylinder into the inner stator;
  - inserting an assembly of the cylinder and the inner stator into a predetermined shape of mold;
  - filling casting between the cylinder and the inner stator by injecting the casting into the mold; and
  - coupling the cylinder to the inner stator by coagulating the casting injected between the cylinder and the inner stator.
- [14] The method of claim 13, wherein the casting injected into the mold is coagulated to couple the cylinder to the inner stator, and to form a predetermined shape of front frame into which the cylinder is inserted.

- [15]        The method of claim 13, wherein, in the step for forming the inner stator, a plurality of passage grooves through which the casting flows are formed in the longitudinal direction on the inside circumferential surface of the inner stator.
- [16]        The method of claim 15, wherein the plurality of passage grooves are formed in the circumferential direction at predetermined intervals on the inside circumferential surface of the inner stator that is a cylindrical stacked body.
- [17]        The method of claim 13, wherein, in the step for forming the cylinder, a plurality of passage grooves are formed on the outside circumferential surface of the cylinder with a predetermined width, depth and longitudinal direction length, so that the casting can flow in the longitudinal direction of the inner stator when injected into the assembly of the cylinder and the inner stator.
- [18]        The method of claim 17, wherein the plurality of passage grooves are formed in the circumferential direction at predetermined intervals on the outside circumferential surface of the cylinder.